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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/578,047

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Jochim Mai

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EXAMINER

MCDONALD, RODNEY GLENN

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/578,047

Applicant(s)

MAI ET AL.

Examiner

Rodney G. McDonald

Art Unit

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 8-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 8-20 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/22)
Paper No(s)/Mail Date 5/06, 12/07.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date ____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 8, 9, 11 and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Cohen et al. (U.S. Pat. 3,699,334).

Regarding claim 8, Cohen et al. teach a method of ion beam processing of a surface of a substrate. Cohen et al. teach positioning the substrate relative to an ion beam that is generated by an ion beam source. Cohen et al. teach partially processing a known property pattern of the surface of the substrate by the ion beam such that a new technologically defined property pattern is formed. Cohen et al. teach adjusting a current geometric action pattern of the ion beam on the surface of the substrate as a function of the known property pattern and of the new technologically defined property pattern, and as a function of the method progress by at least one of modifying the beam characteristics or by pulsing the ion beam. (Column 3 lines 9-27; Column 3 lines 35-44; Column 4 lines 6-47; Column 5 lines 41-68; Column 6 lines 1-68; Column 7 lines 1-46)

Regarding claim 9, Cohen et al. teach the substrate and the ion beam source rotate relative to one another and/or are moved uniformly or non-uniformly linearly, in a circle, or in a technologically pre-specified direction. (Column 4 lines 48-68; Column 5 lines 1-13)

Regarding claim 11, Cohen et al. teach the angle between a surface normal of the surface of the substrate to be processed and the axis of the ion beam striking the surface is modified. (Column 3 lines 43-44; Column 4 lines 44-47; Column 6 lines 37-42; Changing the angle by electrostatic beam steering)

Regarding claim 12, Cohen et al. teach the ion beam source is a wide beam ion source. (Column 4 lines 22-27)

Claims 18 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Itoh et al. (U.S. Pat. 5,223,109).

Regarding claim 18, Itoh et al. teach an apparatus for ion beam processing of a surface of a substrate comprising a substrate support for mounting at least one substrate presenting the surface, the substrate support being disposed within a vacuum chamber and being movable in a Y axis and in an X axis; and an ion beam source being mounted in a wall of the vacuum chamber such that an axis of an ion beam from the ion beam source is perpendicular to the surface of the substrate to be processed in a Z axis such that a distance from the ion beam source to the surface of the substrate is fixed. (Figs. 1, 9; Column 3 lines 46-48; Column 4 lines 1-9)

Regarding claim 20, Itoh et al. teach the ion beam source to be a wide beam ion source. (Column 3 line 65)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 10 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cohen et al. (U.S. Pat. 3,699,334) in view of Reade et al. (U.S. Pat. 6,809,066) or Muraki et al. (EP 1 253 619 A2).

Cohen et al. is discussed above and all is as applies above. (See Cohen et al. discussed above)

Regarding claim 13, modifying the angle is already discussed by Cohen et al. (See Cohen et al. discussed above)

The difference not yet discussed is the ion beam formed from at least two individual ion beams having respective beam characteristics which are controlled synchronously or independent of one another and/or pulsed simultaneously or temporally offset from one another is not discussed (Claim 10).

Regarding claim 10, Reade et al. teach the utilizing two ion beams for texturing the substrate which are controlled to be synchronous form one another. (Column 3 lines 36-46; Column 13 lines 45-65)

Regarding claim 13, Muraki et al. teach utilizing multiple beams synchronously. (Paragraphs 0001, 0020, 0029-0038, 0042, 0044, 0056)

The motivation for utilizing the features of Reade et al. is that it allows for forming the desired texture. (Column 13 lines 11-15)

The motivation for utilizing the features of Muraki et al. is that it allows for performing a process for high precision. (See Abstract)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Cohen et al. by utilizing the features of Reade et al. or Muraki et al. because it allows for forming the desired texture or performing a process for high precision.

Claims 15 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cohen et al. in view of Reade et al. or Muraki et al. as applied to claims 10 and 13 above, and further in view of Smirnov et al. (U.S. Pat. 6,274,007).

The difference not yet discussed is the current geometric action pattern of the ion beam on the surface of the substrate is measured during the course of the method by an ion probe array that is arranged in a plane of the surface of the substrate to be processed (Claims 15, 17).

Regarding claims 15, 17, Smirnov et al. teach the current geometric action pattern of the ion beam on the surface of the substrate is measured during the course of

the method by an ion probe array that is arranged in a plane of the surface of the substrate to be processed. (Column 4 lines 50-56; Column 5 lines 1-11)

The motivation for utilizing the features of Smirnov et al. is that it allows for determining the end of sputtering. (Column 4 lines 50-56).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized the features of Smirnov et al. because it allows for determining the end of sputtering.

Claims 14 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cohen et al. (U.S. Pat. 3,699,334) in view of Smirnov et al. (U.S. Pat. 6,274,007).

Cohen et al. is discussed above and all is as applies above. (See Cohen et al. discussed above)

The difference not yet discussed is the current geometric action pattern of the ion beam on the surface of the substrate is measured during the course of the method by an ion probe array that is arranged in a plane of the surface of the substrate to be processed (Claims 14, 16).

Regarding claims 14, 16, Smirnov et al. teach the current geometric action pattern of the ion beam on the surface of the substrate is measured during the course of the method by an ion probe array that is arranged in a plane of the surface of the substrate to be processed. (Column 4 lines 50-56; Column 5 lines 1-11)

The motivation for utilizing the features of Smirnov et al. is that it allows for determining the end of sputtering. (Column 4 lines 50-56).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Cohen et al. by utilizing the features of Smirnov et al. because it allows for determining the end of sputtering.

Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Itoh et al. (U.S. Pat. 5,223,109) in view of Reade et al. (U.S. Pat. 6,809,066) or Muraki et al. (EP 1 253 619 A2).

Itoh et al. is discussed above and all is as applies above. (See Itoh et al. discussed above)

The difference not yet discussed is the ion beam formed from at least two individual ion beams having respective beam characteristics which are controlled synchronously or independent of one another and/or pulsed simultaneously or temporally offset from one another is not discussed (Claim 19).

Regarding claim 19, Reade et al. teach the utilizing two ion beams for texturing the substrate which are controlled to be synchronous form one another. (Column 3 lines 36-46; Column 13 lines 45-65)

Regarding claim 19, Muraki et al. teach utilizing multiple beams synchronously. (Paragraphs 0001, 0020, 0029-0038, 0042, 0044, 0056)

The motivation for utilizing the features of Reade et al. is that it allows for forming the desired texture. (Column 13 lines 11-15)

The motivation for utilizing the features of Muraki et al. is that it allows for performing a process for high precision. (See Abstract)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Cohen et al. by utilizing the features of Reade et al. or Muraki et al. because it allows for forming the desired texture or performing a process for high precision.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rodney G. McDonald whose telephone number is 571-272-1340. The examiner can normally be reached on M-Th with every Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Rodney G. McDonald/
Primary Examiner, Art Unit 1795

Rodney G. McDonald
Primary Examiner
Art Unit 1795

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